

## GRAVEL ROADMAKING.

How the Material Should Be Applied and Selected.

### UNDERDRAINING IMPORTANT.

With Proper Grading, Gravel Rightly Used Will Make Most Excellent Highways—The Advantage of a Flat Roadway.

Even where gravel employed has been applied in road construction in Maryland owing to its method of application the roads do not always maintain their form as they should in wet weather. This fault is not usually due to the material employed so much as to an entire lack of proper grading and underdraining. Merely to throw some gravel over a wet or spongy place without raising the level of the roadbed or making any provision for the drawing off of the water can never make a road which will not cut through and become muddy whenever the frost comes out of the ground. The water sinks through the gravel covering into the clayey foundation and renders the latter yielding to the overlying road, which pushes the wheels through the gravel into the clay or if the covering is thin causes the clay to be pushed up between the pebbles.

With proper attention toward grading, underdraining and the shaping of



SHOWING HOW GRAVEL IS DEPOSITED AT FOOT OF A HILL WHEN PLACED ON STEEP GRADES.

the road before the gravel is placed upon it considerable improvement may be made on almost any of the roads where gravel is obtainable, as it makes an even, hard and firm roadbed when supported by proper foundations. An example of the better constructed gravel roads is that extending from Marlboro to Washington, which was built originally as a toll road.

An economical form of construction is to use the gravel as a support for a macadam surface where the travel over any particular thoroughfare would warrant such an improvement. The crown or transverse slope of a road should only be sufficient to carry the surface water to the gutters. On dirt roads where ruts are easily formed the slope needs to be more than on a macadamized surface, but never sufficient to cause inconvenience to travel. One inch to the foot or seven and a half inches on a fifteen foot road will be found about right. A good macadam road does not ordinarily need so much crown, depending on the grades. On grades up to and including four feet per hundred one inch to the foot is sufficient; from four to and including six feet per hundred three-quarters of an inch should be allowed. A transverse slope of more than one inch per foot gives too much list to a wagon when at one side. The advantage of a flat road as possible is the lessening of the tendency for the travel to keep to the center of the road and the consequent avoidance of the formation of ruts and a horse path.

There are many counties in Maryland where gravel of excellent quality is abundant and where at the same time there is very little stone that is fit for road construction. The gravel, however, properly applied will make most excellent roads, far superior to any earth road, and, while not possessing the wearing qualities of hard, broken stone, will answer sufficiently well for those country roads that have comparatively light traffic. On roads having very heavy traffic it will be found in the long run to be cheaper even at a very much greater first cost to use a macadam construction owing to the rapid wearing of the gravel road under such circumstances and the consequently large expense for maintenance.

A good gravel can always be told when inspected, as it stands in place in the pit. Whenever it is hard and compact in the bank and requires the use of the pick to loosen it, it will form a hard and compact road. Gravel which contains a small amount of ferruginous clay and has angular, rough fragments of stone is the best that can be obtained. Gravel mixed with sand or composed of smooth, rounded fragments of stone does not compact and form a hard, smooth road surface and is of little use except for general filling. To get the best results from gravel which is formed of various sized fragments it should be screened, all pieces two inches in size being thrown to one side. There are found in many places gravel deposits which contain few fragments over two inches. Such gravel does not need to be screened, but could be spread upon the road directly from the pit unless too sandy.

The two inch gravel is spread upon the roadbed to such a depth that when rolled it will have a thickness of three to four inches. Over this first course is spread the second course, composed of the smaller gravel, with fragments one inch or less in size. The second

course is treated similarly to the first. The rolling is continued until any depressions cease to be formed. Whenever depressions are noticed during the rolling materials should immediately be spread upon such places and the rolling continued until the surface is brought up to true grade. The gravel should not be dry when rolled. If furnished dry, it may be sprinkled or the rolling put off until after a rain. The top course should be about three inches thick after rolling.

Usually a gravel road does not become firm and hard until after a considerable time, during which it needs constant attention. Each year, however, the roadbed becomes firmer and ultimately nearly as solid as macadam.

### HINTS FROM MISSOURI.

How to Use the King Drag and Have an Ideal Road.

In Missouri the roads are really bad, and improvement by the King road drag has been taken up systematically. The following suggestions are from a bulletin by the Missouri board of agriculture:

Don't drive too fast.  
Don't walk. Get on the drag and ride.  
Don't wait for your neighbors to take hold. They may be waiting on you.  
Don't wait for the big grader to come and shape up your road. All you can do first will help to make the work of the grader permanent.  
Don't try to drag with one piece; use two. One will scoop out the hollows in the road and deepen them. When two are used the one keeps the other up, and soon the hollows will have filled and become level like the balance of the road.

Don't wait for good roads until the city folks begin to talk about macadam at public expense. This will cost from \$3,000 to \$5,000 a mile, and for country purposes, where there is no heavy hauling, it is no better than, not as easily maintained as, a road properly made with the drag. Five dollars a mile with a proper use of the road drag will keep the ordinary country road that is properly drained, graded and bridged or culverted in first class condition nine months in the year and make it a fairly decent road the other three months. But this cannot be done in one year or two. The longer the drag is used intelligently the better the road will become until finally it is oval and smooth and hard and elastic. This is the ideal road, and nothing but a road properly made with the drag or an asphalt road meets all these requirements.

### AN ASPHALT ROAD.

New Jersey to Experiment With Mixture of That Product With Dirt.

The New Jersey state department of highways is to construct in Mercer county an experimental mile of a new automobile road, the plans for which State Road Supervisor Robert A. Meeker recently obtained in Kansas City. Mr. Meeker says the new method of construction is simple and cheap, that it is self healing when broken and therefore practically indestructible, that it improves with age, that it is mudless, noiseless and almost dustless and that it is not slippery even when coated with ice.

In the building of the road the original soil is finely pulverized, and then into this there is worked a mixture of hot asphalt, the whole mass being firmly rolled in the finishing. Breaks are quickly repaired by traffic, the weight of wheels cementing them together. The base yields slightly to heavy traffic and then regains its original shape. It is equally good for horses and automobiles.

If the experiment proves a success, it is likely that the result will be a radical change in the road building methods of the state of New Jersey, with the substitution of asphalt for the macadam process now used.

### Million a Year For Roads.

Connecticut still leads in the good roads movement as a state. She was the third to get into it, New Jersey being the first, four years before her, and Massachusetts the second, in 1893. Now Connecticut spends \$1,000,000 a year, while the first spends but \$600,000 and the second but \$100,000 less than that. Connecticut spends the largest amount per capita for good roads by far, the only other states whose total annual appropriations are larger being New York, with \$5,000,000, and Pennsylvania, with \$1,500,000, but both states are vastly larger than little Connecticut.

### Bad Roads, Indeed.

It is no wonder that the grangers are speaking pieces in favor of better roads, as the mud is something formidable on the country roads. At East Longmeadow, Mass., one of the churches was closed on a recent Sunday on account of the muddy condition of the roads, says the Hartford Times. A Hartford funeral party, driving to Cromwell, found the roads impassable in some places, rendering it necessary to take to the fields. The milkmen and teamsters declare that they "never saw the beat of it," and the chauffeur who gets off the macadam is entitled to a premium.

### The Cheapest Roadmaker.

The "good roads without money" movement that has by means of King's split log road drag converted the slough holes of the "corn belt" roads into model turnpikes is extending to the eastern states, where most roads are either very good or very bad, says Garden Magazine. Mr. King is arranging with the various state boards of agriculture to give a series of practical demonstrations of the use of his device on eastern roads where the success of road dragging is more doubtful because of sand and rocks.

### TO BANISH WOODEN INDIANS.

Cherokee Senator Has Bill to Prohibit Use by Cigar Stores.

CHICAGO, July 30.—A dispatch to the Record-Herald from Guthrie, Okla., says:

Senator Landrum, a Cherokee Indian, introduced a bill prohibiting the use of Indians as cigar or tobacco store signs. The bill will pass both branches of the Legislature and become a law, as all political parties declare the large Indian vote holds the balance of power.

The bill provides a fine of \$50 and six months' imprisonment for any person who uses an Indian figure, no matter for what purpose, or who has such figure in his possession.

### TEACHER'S ANNUAL INSTITUTE.

The Annual Teachers' Institute for Coos County for the year 1908, will convene at Myrtle Point, August 18-20. Among the instructions from without the county who will attend and assist in the sessions of this meeting, will be State Superintendent Ackerman, Superintendent R. F. Robinson, Prof. Jones and Prof. Traver. An excellent time is anticipated for those who will attend. Every one interested in the educational advancement of the county should arrange to be present.

W. H. BUNCH,  
Co. Superintendent.

### TEACHER'S EXAMINATION.

Notice is hereby given that the regular semi-annual examination of applicants for State and County papers will be held in the Court House at Coquille, Oregon, beginning August 12, 1908, and continuing three days. Dated this 24th day of July, 1908.

W. H. BUNCH,  
Co. Superintendent.

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## Thirty Lots in Bennett's Bandon Beach, Plat "A"

Lots 50x100 will be sold—corners at \$45.00 and inside at \$35.00—between now and August 1st, at which time remaining unsold lots will be taken off the market, or prices advanced. Last chance of cheap lots by the Seaside. For particulars, apply Bennett's Land Office, Flanagan & Bennett Bank Building, or STUTSMAN & CO. - Marshfield, Oregon

Wheeler Real Estate Company - Bandon  
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